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TAXONOMIC REVISION OF THE GENUS *MEGOURA* BUCKTON (HEMIPTERA: APHIDIDAE) FROM THE KOREAN PENINSULA WITH THE DESCRIPTION OF A NEW SPECIES AND A KEY TO THE WORLD SPECIES

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Abstract.—Three species of *Megoura* are recognized from the Korean Peninsula, among which ***Megoura nigra* Lee, n. sp.**, and the fundatrix, hitherto unknown morph, of *M. crassicauda* Mordvilko 1919 are described. *Megoura nigra* can be distinguished easily from other species of *Megoura* by its dark brown body color in life. It also differs from the closely related species *M. crassicauda* and *M. viciae* Buckton 1876 by its relatively long ultimate rostral segment, 0.88–1.00× 2HT (0.63–0.87× in the latter two species), mandibular laminae, antennal segment I, abdominal tergite III, and genital plate with 6–8, 13–20, 16–21, and 24–33 hairs respectively (3–5, 8–15, 12–18, and 14–23 in the latter two species). After examining and measuring the specimens of all known *Megoura* spp., a worldwide key to species is presented.

Key Words: Hemiptera, Aphididae, *Megoura,* Korea, key to world species

The Genus *Megoura* Buckton 1876 is a small genus of the tribe Macroshipini (Hemiptera: Aphididae) with six valid species described from the Palearctic Region; three (*M. crassicauda* (Mordvilko 1919), *M. lespedezae* (Essig and Kuwana 1918), and *M. brevipilosa* (Miyazaki 1971)) from East Asia, one (*M. dooarsis* (Ghosh and Raychaudhuri 1969)) from the Indian subregion, and two (*M. viciae* Buckton 1876 and *M. litoralis* Müller 1952 in Börner 1952) from Europe, Central Asia, and the Middle East (Remaudière and Remaudière 1997, Blackman and Eastop 2000, Miyazaki 1971). This genus is characterized by having swollen siphunculi and, so far as is known, living only on limited genera of Leguminosae: *Vicia* Tourn. ex Linn., *Lathyrus* Linn., *Hedysarum* Linn., *Indigofera* Linn., *Cajanus* DC., *Desmodium* Desv., and *Lespedeza* Michx. All known species are green in life, and some species have antennae, legs, siphunculi, and cauda dark brown.

In the Korean Peninsula, two species (*M. crassicauda* and *M. lespedezae*) have been recorded by Okamoto and Takahashi (1927) and Paik (1965, 1972). These two species are very common throughout the Korean Peninsula where their host plants occur.

In 1999, we collected dark brown colonies of *Megoura* on *Vicia venosa* Maxim. Subsequently, we have collected and examined many samples of *Megoua* throughout South Korea including Jeju Island. Moreover, many South Korean specimens stored in the National Institute of Agricultural Sciences and Technology, and North Korean specimens collected by Jan Havelka in 1985, 1987, and 1988, were also examined. As a result, three species are recognized, among which the dark brown *M. nigra* is described as new to science and the

fundatrix, hitherto unknown morph, of *M. crassicauda* is reported for the first time. In addition, after examining and measuring the specimens of all known *Megoura* spp., a worldwide key to the species of the genus *Megoura* is presented.

Abbreviations used for descriptions in this paper are as follows: Ant.I, II, III, IV, V, VIb = antennal segment I, II, III, IV, V, and the base of Ant.VI, respectively; PT = processus terminalis; URS = ultimate rostral segment; ML = mandibular laminae; 2HT = second segment of hind tarsus; SIPH = siphunculus.

Names of host plants were checked by "The Plant Names Project (1999). International Plant Names Index. Published on the Internet; http://www.ipni.org [accessed 29 September 2001]."

All specimens examined in this paper are housed in the National Institute of Agricultural Science and Technology (NIAST), Suwon, Korea, and the Institute of Entomology, Czech Academy of Sciences (IE CAS), Ceske Budejovice, Czech Republic. The holotype and paratypes of *M. nigra*, n. sp., are housed in NIAST.

Megoura Buckton 1876

Megoura Buckton 1876: 64 (type species: *Megoura viciae* Buckton 1876).

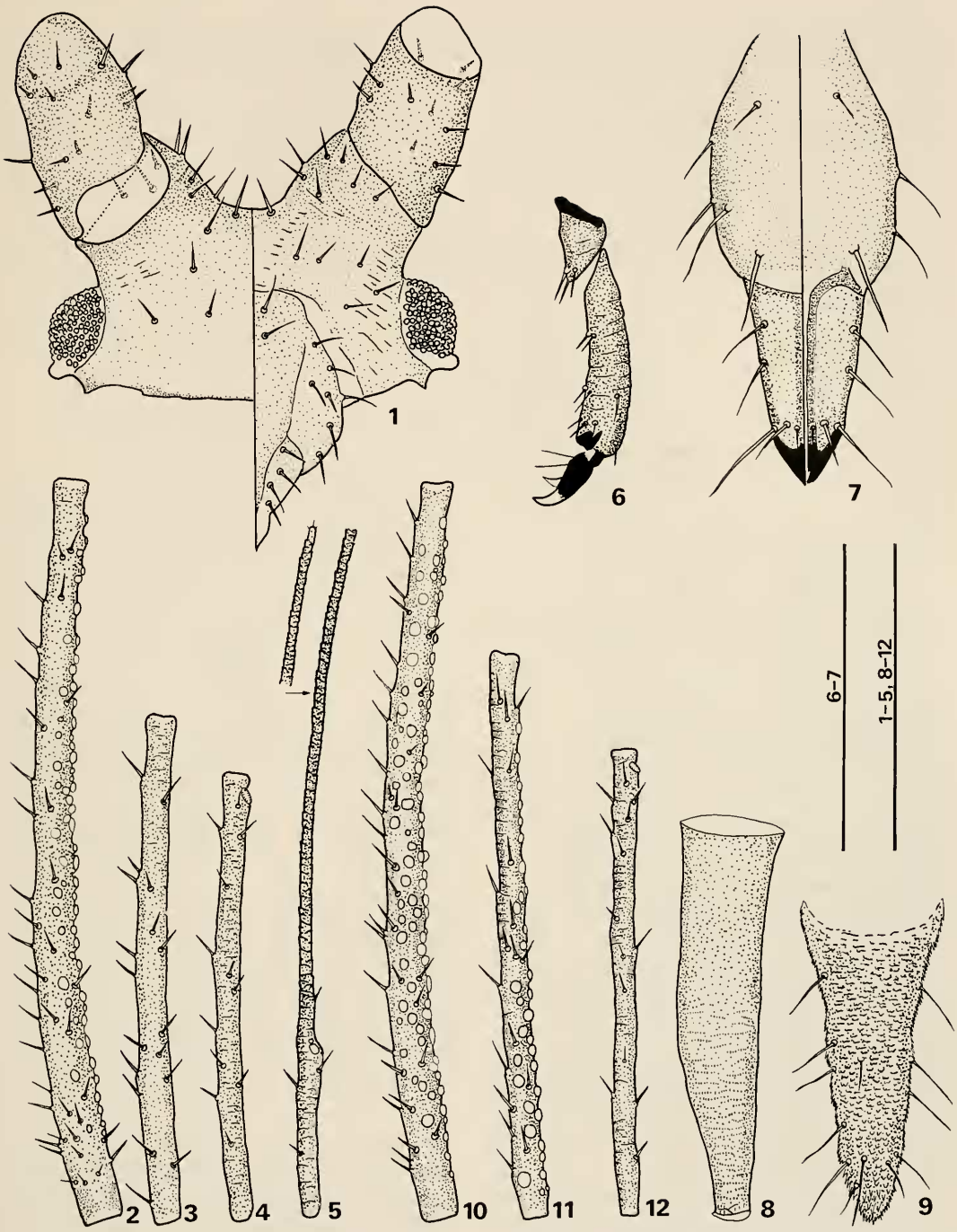
Drepaniella del Guercio 1913: 188 (type species: *Aphis viciae* Kaltenbach 1843, not Fabricius 1781 = *Megoura viciae* Buckton 1876).

Neomegouropsis Ghosh, Basu and Raychaudhuri 1977: 584 (type species: *Megouroparsus dooarsis* Ghosh and Raychaudhuri 1969).

Megoura nigra Lee, new species
(Figs. 1–12, Table 1)

Description.—*Alate viviparous female.* Color (in life): Entirely dark reddish brown, almost black. Color (in macerated specimens): Head including antennae and rostrum dark brown. Prothorax pale brown; meso- and metathorax pale with spinal and marginal pigmented sclerites. Abdomen pale with marginal and occasionally dorsal small pigmented sclerites at base of hair; ante- and postsiphuncular sclerite well pigmented; tergite VII and VIII with pale brown horizontal bands. Legs dark brown except bases of femora and tibiae from base to distal 1/5. SIPH and cauda dark brown.

Morphology: Body 3.13–4.28 mm long. *Head:* Smooth with 4 pairs of acute dorsal hairs; antennal tubercle well developed, bearing 5–7 hairs, frons with 1 pair of ventral hairs. Antenna 3.43–4.63 mm long, as long as or longer (0.99–1.29×) than body length; Ant.I smooth with 13–20 hairs; Ant.II smooth with 6–8 hairs; Ant.III smooth with 28–64 secondary rhinaria; longest hair on Ant.III 0.60–0.85× the basal width of segment; Ant.IV and Ant.V imbricated; primary rhinarium on Ant.V ciliated, longest diameter distinctly shorter than middle width of Ant.V; Ant.VIb imbricated with 3–4 hairs; PT imbricated, 3.42–4.13× as long as base of Ant.VIb. Rostrum attaining frontal margin of hind coxae; clypeus with 4 hairs; mandibular laminae (ML) with 6–8 hairs; URS wedge-shaped, as long as or slightly shorter (0.88–1.00×) than 2HT with 2 pairs of secondary hairs. *Thorax:* Prothorax with 2–3 mesial and 3 marginal hairs anteriorly. Hind coxae spinulated with ca. 14 acute hairs; hind trochanter smooth with 3 hairs; hind femur smooth, more than 2× as long as SIPH; hind tibia smooth; first tarsal chaetotaxy 3: 3:3; 2HT imbricated with 2–4 dorsal, 6–7 ventral hairs. *Abdomen:* Abdominal dorsum membranous with marginal pigmented sclerites on abdominal tergites II–IV, and small pigmented sclerites at base of hairs; ante- and postsiphuncular sclerites large, well developed; 16–21 hairs on tergite III including marginal ones, 6–11 on tergite VI between SIPH, and 4–8 on tergite VIII; genital plate weakly pigmented, spinulated with 2–4 median long hairs and 22–30 short hairs on posterior margin. SIPH 1.09–1.33× cauda, swollen in middle, middle diameter 2× as wide as the distal diameter. Cauda elongated, tapering to apex with 10–



Figs. 1–12. *Megoura nigra*. 1–8, Apterous viviparous female. 1, Dorsal and ventral surface of head. 2, Antennal segment III (Ant.III). 3, Antennal segment IV (Ant.IV). 4, Antennal segment V (Ant.V). 5, Antennal segment VI (Ant.VIb + PT). 6, Tarsal segments. 7, Third and ultimate segment of rostrum (URS). 8, Siphunculus. 9, Cauda. 10–12, Alate viviparous female. 10, Antennal segment III (Ant.III). 11, Antennal segment IV (Ant.IV). 12, Antennal segment V (Ant.V). Scale bars equal 0.5 mm for Figs. 1–5, 8–12 and 0.25 mm for Figs. 6–7.

15 hairs, denticulated at basal half, spinulated in a group of 2–3 spinules at distal half.

Alate viviparous female. Color (in life): Thorax entirely dark brown. Abdomen with large marginal sclerite on each segment. Wings transparent with narrow dark pigmentation along veins and stigma. *Morphology:* Ant.III and Ant.IV with 62–89 and 19–37 secondary rhinaria respectively. Otherwise like apterous viviparous female.

Apterous oviparous female. Hind tibia swollen with numerous pseudosensoria. Otherwise like apterous viviparous female.

Alate male. About 24 and 18 secondary rhinaria on Ant.IV and Ant.V, respectively. Abdomen with additional dark horizontal pigmented sclerites on each segment. Otherwise like alate viviparous female.

Measurements: See Table 1.

Type material.—Holotype. Apterous viviparous ♀, South Korea: Gyounggi-do: Pocheon: Gwangreung National Arboretum, 11.v.2001, Slide no. 010511-sh-01(apt.5), on *Vicia venosa* Maxim.

Paratypes. 32 apterous viviparous ♀, 39 alate viviparous ♀, same collection data of holotype; 15 apterous viviparous ♀, same locality of holotype, 21.v.1999, coll. #990521-16sh, on *V. venosa*; 2 alate ♂, 3 oviparae, same locality, 19.x.2000, coll. #001018-sh-33, on *V. venosa.*

Biology and host plants.—So far, this species has been observed only on *V. venosa* in the Gwangreung National Arboretum, South Korea. It lives on young stems or undersides of young leaves. Males and oviparae occur in the middle of October, and it is monoecious holocycly on *V. venosa.*

Distribution.—South Korea.

Etymology.—The species name *nigra* is derived from the dark reddish brown to almost black body color in life, whereas all other species of *Megoura* are green in life.

Notes.—Morphologically, this species is similar to *M. crassicauda* and *M. viciae* from which it can be distinguished by its entirely dark brown body color (green in the latter species), relatively long ultimate rostral segment, 0.88–1.00× 2nd hind tarsus (0.63–0.87× in the latter species), 6–8, 13–20, 16–21, and 24–33 hairs on mandibular laminae on each side, antennal segment I, abdominal tergite III, and genital plate respectively (3–5, 8–15, 12–18, and 14–23 in *M. crassicauda* and *M. viciae*), and relatively long siphunculi, 1.08–1.33× cauda (siphunculi shorter than cauda in *M. crassicauda*) (see Table 1 and Table 2). It also can be easily separated from other species of *Megoura* by dark brown body color.

Megoura crassicauda Mordvilko 1919 (Figs. 13–21)

Megoura viciae crassicauda Mordvilko 1919: 327.

Rhopalosiphum viciae var. *japonicum* Matsumura 1918: 10. (Invalid by Hille Ris Lambers 1965.)

Nectarosiphum moriokae Shinji 1923: 308. (Syn. by Moritsu 1948.)

Megoura viciae japonica: Moritsu 1948: 84; Tao 1963: 183.

Megoura japonica: Okamoto and Takahashi 1927: 133.

Megoura viciae coreana Moritsu 1948: 84; Paik 1965: 72. (Syn. by Hille Ris Lambers 1965.)

Nectarosiphum moriokae Shinji 1923: 308. (Syn. by Moritsu 1948.)

Amphorophora lathyri Shinji 1924: 365. (Syn. by Moritsu 1948.)

Megoura lathyri: Shinji 1941: 897.

Amphorophora vicicola Shinji 1941: 773.

Megoura crassicauda: Hille Ris Lambers 1965: 195.

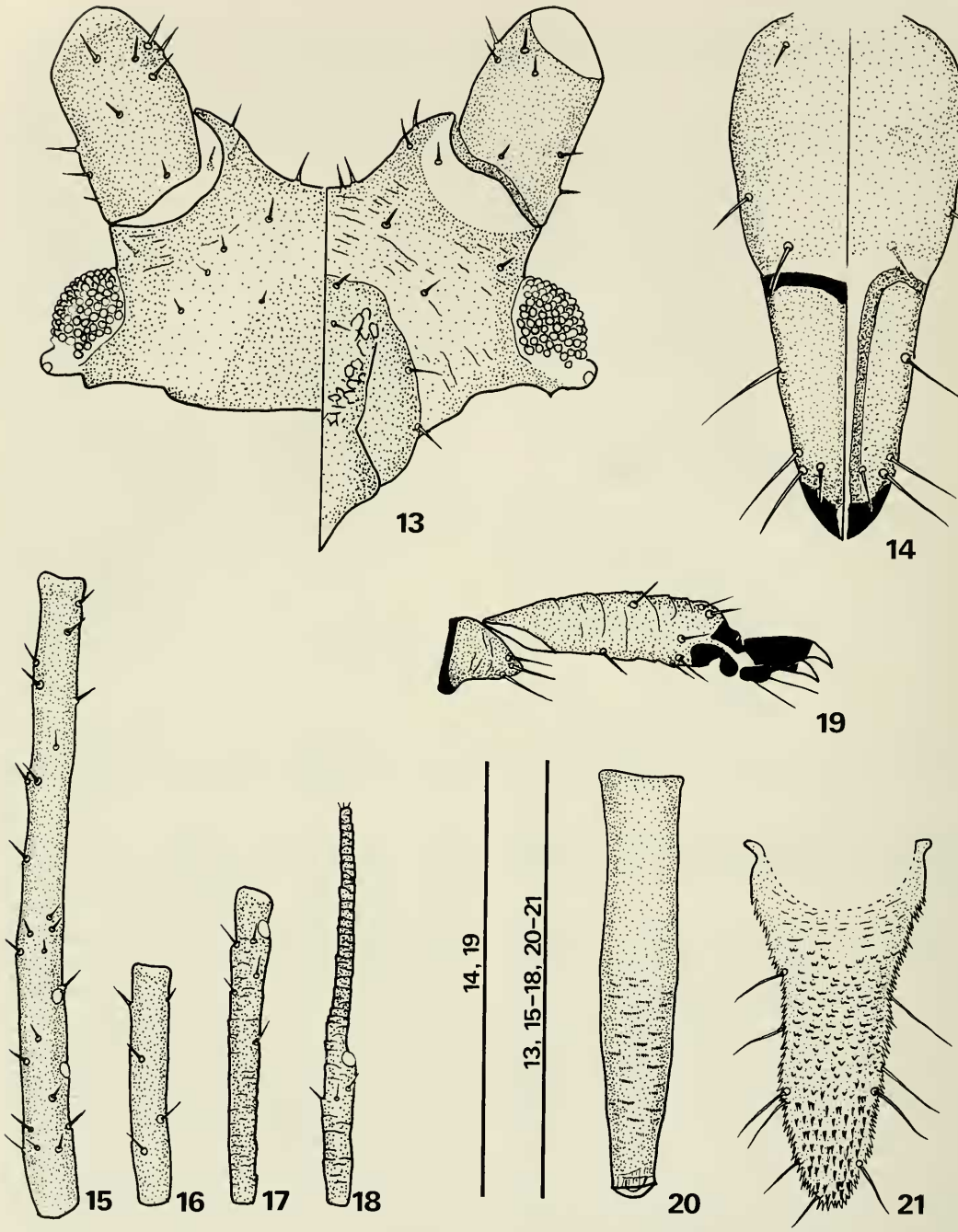
Description.—Fundatrix. Color (in life): Body green except head, antenna, legs, siphunculi, and cauda black or dark brown. Color (in macerated specimens): Head including antenna and rostrum dark brown. Thorax pale with irregular dorsal and lateral dark sclerites; legs dark brown except extreme bases of femora pale brown. Abdomen pale; antesiphuncular sclerite dark brown, postsiphuncular sclerite small; ter-

Table 1. Biometric data of *Megoura nigra*.

	Part	Apterous vivipara (n = 10) Min.–Max. (Avr.)	Alate vivipara (n = 10) Min.–Max. (Avr.)
Length of (in mm)	Body from antennal tubercle to cauda	3.13–4.28 (3.75)	3.00–3.88 (3.37)
	Whole antennae	3.43–4.63 (4.13)	3.38–4.63 (4.21)
	Antennal segment III (Ant. III)	0.96–1.32 (1.17)	1.00–1.21 (1.10)
	Antennal segment IV (Ant. IV)	0.56–0.88 (0.77)	0.73–0.91 (0.82)
	Antennal segment V (Ant. V)	0.56–0.80 (0.71)	0.65–0.81 (0.73)
	The base of antennal segment VI (Ant. VIb)	0.21–0.29 (0.26)	0.23–0.29 (0.25)
	Processus terminalis (PT)	0.75–1.08 (0.98)	0.90–1.15 (1.06)
	Ultimate rostral segment (URS)	0.13–0.14 (0.139)	0.13–0.15 (0.141)
	Hind tibia	1.93–2.70 (2.39)	2.20–2.95 (0.45)
	Hind femur	1.11–1.63 (1.44)	1.19–1.63 (1.36)
	Hind tarsus II (2HT)	0.14–0.16 (0.150)	0.12–0.15 (0.14)
	Siphunculus (SIPH)	0.50–0.70 (0.60)	0.45–0.58 (0.53)
	Cauda	0.45–0.60 (0.51)	0.38–0.50 (0.45)
No. hairs on	Antennal segment I (Ant. I)	13–20 (15.75)	13–19 (15.25)
	Ultimate rostral segment (URS)	4–4 (4.00)	4–4 (4.00)
	Mandibular laminae (ML)	6–8 (6.90)	6–8 (6.60)
	Tergite III	16–21 (19.00)	20–24 (22.30)
	Tergite VI between SIPH	6–11 (7.50)	5–9 (7.10)
	Tergite VIII	4–8 (5.70)	4–6 (5.50)
	Genital plate	24–33 (28.10)	23–31 (26.00)
	Cauda	10–15 (12.20)	12–14 (12.60)
No. rhinaria on	Ant. III	28–64 (53.30)	62–89 (71.90)
	Ant. IV	0–4 (0.20)	19–37 (28.85)

gite VII and VIII with transverse dark brown bands. SIPH, cauda, and genital plate dark brown.

Morphology: Body oval or short spindle-shaped. *Head:* Smooth with 4 pairs of short hairs; antennal tubercle developed with 2–5 hairs on each side; longest hair on dorsum shorter (0.7×) than basal width of Ant.III. Antenna short, 0.56–0.70× body length; Ant.I and Ant.II smooth or slightly spinulated, bearing 6–10 and 3–6 hairs, respectively; Ant.III smooth with 1–4 secondary rhinaria on basal ½; Ant.IV short, less than 0.5× Ant.III, weakly imbricated; Ant.V imbricated, bearing small primary rhinarium, longest diameter less than 0.5× as long as middle width of Ant.V; Ant.VI strongly imbricated; PT short 1.65–2.23× base of Ant.VI; longest hair on Ant.III ⅔× basal width of segment. Rostrum attaining mesocoxae; clypeus with 4 hairs; ML with 2–4 hairs on each side; URS 0.92–1.08× and 0.71–1.00× as long as 2HT and Ant.VIb, bearing 1 pair of hairs. *Thorax:* Prothorax with 1 pair of spinal hairs and 2 pairs of marginal hairs anteriorly. Hind coxae spinulated with ca. 10 hairs; hind trochanter smooth with 2–3 hairs; hind femur spinulated, 1.50–1.89× SIPH, longest hair less than 0.5× basal width of segment; hind tibia smooth, longest hair shorter than middle width of segment; first tarsal chaetotaxy 3: 3:3; 2HT imbricated, bearing 3–5 dorsal hairs and 3–4 ventral hairs. *Abdomen:* Abdominal dorsum membranous with 9–11, 4–6, and 5–7 hairs on tergite III, tergite VI between SIPH, and tergite VIII respectively; longest hair on abdomninal dorsum less than 0.5× basal width of hind femur; antesiphuncular sclerite well developed; postsiphuncular sclerite small or undeveloped; tergites VII and VIII with transverse dark



Figs. 13–21. Fundatrix of *Megoura crassicauda*. 13, Dorsal and ventral surface of head. 14, Third and ultimate segment of rostrum (URS). 15, Antennal segment III (Ant.III). 16, Antennal segment IV (Ant.IV). 17, Antennal segment V (Ant.V). 18, Antennal segment VI (Ant.VIb + PT). 19, Tarsal segments. 20, Siphunculus. 21, Cauda. Scale bars equal 0.5 mm for Figs. 13, 15–18, 20–21 and 0.25 mm for Figs. 14, 19.

bands; genital plate well-pigmented, weakly spinulated with 2–6 median hairs and 12–18 short hairs on posterior margin. SIPH 1.10–1.43× cauda, 0.62–0.78× Ant.III, and 0.53–0.67× hind femur, cylindrical, slightly swollen and widest in middle, smooth at basal half, weakly spinulated on distal half. Cauda elongated tongue-shaped, spinulated ventrally in a group of 1–4 spinules, bearing 8–13 hairs.

Measurement (mininum-maximum (average) in mm): Body, 2.87–3.43 (3.12). Antenna total, 1.80–2.13 (1.93); Ant.I, 0.15–0.17 (0.16); Ant.II, 0.11–0.12 (0.112); Ant.III, 0.61–0.73 (0.66); Ant.IV, 0.20–0.28 (0.25); Ant.V, 0.29–0.36 (0.32); Ant.VIb, 0.13–0.17 (0.154); PT, 0.25–0.33 (0.29). Hind tibia, 1.25–1.48 (1.32); hind femur 0.72–0.85 (0.77); 2HT, 0.12–0.13 (0.124). SIPH, 0.45–0.50 (0.47). Cauda, 0.34–0.41 (0.37). URS, 0.25–0.33 (0.29).

Specimens examined.—Five fundatrix, South Korea: Jeju-do: Bukjeju: Oo-do: Joil-ri, 19.iv.2000, Coll.# 00417-sh-39, on *Vicia angustifolia* L. Numerous apterous and alate viviparous ♀, oviparous ♀ and alate ♂ throughout the Korean Peninsula, on *Pisum sativum* Linn., *Vicia* spp. (*amurensis* Oettingen, *angustifolia* L., *unijuga* A. Br.), and *Lathyrus japonicus* Willd.

Biology and host plants.—This species lives on young stems or underside of leaves. It is holocyclic on *Vicia* spp. (*amurensis, angustifolia, cracca, faba, segetalis* Thuill., *unijuga*), and *Lathyrus* spp. (*davidii* Hance, *japonicus*). Also collected on *Pisum sativum* in Korea.

Distribution.—Korean Peninsula, Russia (Siberia, Primorskii), Japan, China, Taiwan.

Note.—Hille Ris Lambers (1965) considered *M. viciae* subsp. *crassicauda* Mordvilko 1919 as a separate species based on "having numerous protruding rhinaria over about ⅓–⅞₁₀ of antennal segment III along one side of the segment in apterae and also the antennal segment IV covered with a number of rhinaria in alate." According to our examination and measurements for European samples of *M. viciae* and East Asian samples of *M. crassicauda* from Korea and Japan, it was found that some European samples from Slovakia have up to 26 secondary rhinaria scattered on Ant. III in apterae. Conversely, some specimens of *M. crassicauda* from Korea have only 20 secondary rhinaria, mostly located in a line as like *M. viciae*. The fundatrix of *crassicauda* described here is also closely related to that of *M. viciae* described by Heie (1995). In spite of these overlapping chracteristics and similarity, all alate samples of *M. crassicauda* from Korea and Japan could be seperated by having more than 17 secondary rhinaria on antennal segment IV, whereas European *M. viciae* have no secondary rhinaria or rarely 1–7 on basal ½ of Ant.IV (see Table 2).

Megoura lespedezae (Essig and Kuwana 1918)

Rhopalosiphum lespedezae Essig and Kuwana 1918: 57.

Myzus lespedezae: Shinji 1927: 59.

Amphorophora lespedezae: Shinji 1941: 744; Tao 1963: 184; Paik 1965: 73.

Megoura abnormis Ghosh 1970: 7. (Syn. by Ghosh 1973.)

Megoura cajanae Ghosh, Ghosh and Raychaudhuri 1971: 385.

Megoura lespedezae: Miyazaki, 1971: 49; Remaudière and Remaudière 1997: 118.

Specimens examined.—Numerous apterous viviparous ♀, alate viviparous ♀, and oviparous ♀ throughout the Korean Peninsula on *Lespedeza bicolor* Turcz.

Biology and host plants.—This species is holocycly on *Lespedeza* spp. (*bicolor* Turcz., *cyrtobotrya* Miq.). It lives on the young stem or underside of leaves.

Distribution.—Korean Peninsula, Japan, China, Taiwan, India, Switzerland (recently discovered by Giacalone and Lampel 1996).

Table 2. Morphological comparison of *Megoura viciae*, *M. crassicauda*, and *M. nigra*.

Morph	Characters		*M. viciae**	*M. crassicauda**	*M. nigra*
Apterous female	Body colour (in life)		Green	Green	Dark brown
	Hairs on	Ant. I	8–15 (10.9)	9–13 (10.5)	13–20 (15.8)
		ML	3–4 (3.6)	4–5 (4.3)	6–8 (6.90)
		Tergite III	12–16 (14.4)	15–18 (16.8)	16–21 (19.0)
		Genital plate	14–22 (17.7)	14–23 (18.8)	24–33 (28.10)
	Ratio	URS/2HT	0.632–0.824 (0.723)	0.684–0.875 (0.767)	0.875–1.000 (0.927)
		SIPH/cauda	0.812–1.000 (0.906)	0.963–1.185 (1.037)	1.087–1.333 (1.184)
	Secondary rhinaria on Ant. III		5–26 (14.8)	20–42 (34.3)	28–64 (53.3)
Alate female	Secondary	Ant. III	23–48 (33.8)	46–64 (54.9)	62–89 (71.9)
	rhinaria on	Ant. IV	0–7 (2.0)	17–31 (24.1)	19–37 (28.85)

* Specimens measured for *M. viciae* and *M. crassicauda* in comparison with *M. nigra* sp. nov.

Megoura viciae: 2 apt. 2 al., Czech Republic: Bohemia: Karlstejn, on *Vicia faba*, No. 4531; 2 apt., 1 al., Slovakia: Viricky, 27.vi.1966, No. 10495b, on *Lathyrus nigricans*; 2 apt., 2 al., Czech Republic: Bohemia: Mt. Stozec, 25.vii.1991, No 22354, on *Lathyrus pratensis*; 2 apt., Rumania: Paniceni, 6.vii.1976, No. 15990B, on *L. pratensis*; 2 apt., 3 al., Russia: Moskva: Abramcevo, 14.vii.1967, No. 11169B, on *V. faba*.

Megoura crassicauda: 4 apt., 1 al., Japan: Chiba: Naganuma, 18.vi.1981; 2 apt., 1 al., North Korea: Pyongsong: Mt. Ryoungak-san, 15.vi.1987, No. 87HA1869, on *Vicia japonica*; 2 apt., 1 al., North Korea: Pyongyang: Bot. Garden, 2.vi.1988, No. 88HA2772, on *V. faba*; 1 apt., 1 al., North Korea: Mt. Myohang-san: Toggol, 16.vi.1985, No. 85HA796, on *V. japonica*; 1 al., North Korea: Haeju: Mt. Suyan-san, No. 87HA1587, on *V. japonica*; 5 apt., South Korea: Jeju-do: Namjeju: Daejeong: Hamo-ri, 15.viii.1998, on *L. japonicus*; 5 apt., South Korea: Ulreung Island: Naribunji, 8.vi.2000, No. 00065-sh92, on *Vicia* sp.; 5 apt., South Korea: Gangwon-do: Inje: Guidun-ri, 4.vi.1999, No. 990602-69sh. on *Vicia* sp.

Key to World Species of *Megoura*

Apterous Viviparous Females

1. Cauda dark brown or black. On *Vicia* spp. or *Lathyrus* spp. 2
– Cauda pale yellow, at most fuscous. Not on *Vicia* spp. 4
2. Body totally dark brown or black in life. Tibia pale yellow except apical ⅕ in macerated specimens. Ultimate rostral segment (URS) as long as or slightly shorter (0.88–1.00×) than 2nd hind tarsus (2HT). Antennal segment I (Ant.I), mandibular laminae (ML), abdominal tergite III, and genital plate with 13–20, 6–8, 16–21, and 24–33 hairs respectively. Ant.III with usually more than 50(28–64) secondary rhinaria. On *Vicia venosa* Maxim. South Korea . . . . . *M. nigra* Lee, n. sp.
– Body green except antenna, legs, siphunculus, and cauda black in life. Tibia black or dark brown in macerated specimens. URS distinctly shorter (0.63–0.87×) than 2HT. Ant.I, mandibular laminae, abdominal tergite III and genital plate with fewer hairs, 8–15, 4–5, 15–18, and 14–23 respectively. Ant.III with usually less than 40 (5–42) secondary rhinaria 3
3. Antenna with more than 20 secondary rhinaria on Ant.III scattered irregularly over ⅔ or throughout the segment. SIPH as long as or frequently longer than cauda. On *Vicia* spp. (*amurensis* Oettingen, *angustifolia* L., *cracca* Linn, *faba* Linn., *segetalis* Thuill., *unijuga* A. Br.), *Lathyrus* spp. (*davidii* Hance, *japonicus* Willd), and *Pisum sativum* Linn. East Asia (Korea, China, Taiwan, Japan, Russia (Far East)), and India . . . . *M. crassicauda* Mordvilko
– Antenna usually with less than 20 secondary rhinaria on Ant.III, confined to basal half or ⅔ in a line. SIPH usually shorter than cauda, at most equal. On *Vicia* spp. (*cracca, faba, sativa* Linn.) and *Lathyrus* spp. (*pratensis* Linn, *montanus* Bernh..). Europe, Central Asia, Middle East, Ethiopia . . . . . *M. viciae* Buckton
4. SIPH pale, shorter (0.67–0.95×) than cauda. Ant.III with more than 10 secondry rhinaria. All legs pale except distal end of tibiae and tarsi pale brown. Processus terminalis (PT) 3.55–3.67× as long as base of Ant.VI. On *Lathyrus maritimus* Bigel. Northern Europe (Denmark, Sweden, Finland, Norway, Poland, northrn Germany) . . . . . *M. litoralis* Müller
– SIPH dark brown or black, distinctly longer than cauda. Ant.III with fewer than 10 secondary rhinaria. Legs dark brown, at least fuscous on distal half of femur and tibiae. PT more than 4.5× as long as base of Ant.VI 5
5. URS 0.89–1.17× as long as 2HT, 0.68–0.88× Ant.VIb. Antennal tubercle weakly developed. Frons more than twice as wide as median depth. Antenna short, 0.83–0.94× as long as body length. SIPH 1.07–1.31× as long as Ant.III. On *Lespedeza* spp (*bicolor* Turcz., *cyrtobotrya* Miq.), *Cajanus cajan* Druce, *Desmodium trifolium* (L.) DC. East Asia (Korea, Japan, China, Taiwan), India, Swizerland (recently discovered by Giacalone and Lampel 1996) . . . . . *M. lespedezae* (Essig and Kuwana)
– URS 0.71–0.83× as long as 2HT, 0.47–0.54× Ant.VIb. Antennal tubercle well developed. Frons V-shaped, as wide as median depth. Antenna at least 1.3× as long as body length. SIPH shorter than Ant.III 6
6. Cauda short, 0.5× as long as SIPH. SIPH with narrow base, basal diameter shorter than middle diameter. Hairs on Ant.III 0.5× as long as basal width of Ant.III. On *Indigofera* (*dosua* Wall., *gerardiana* R. Grah., *teysmanni* Miq.), *Hedysarum campanulatum.* Indian Subregion (India, Pakistan, Afghanistan, Kashmir), and Thailand . . . . . *M. dooarsis* (Ghosh and Raychaudhuri)
– Cauda elongated, more than 0.7× as long as SIPH. SIPH widest at base. Hairs on Ant.III very short, ¼× as long as basal width of Ant.III. On *Lespedeza bicolor.* Alate viviparous female unknown. Japan . . . . . *M. brevipilosa* Miyazaki

Alate Viviparous Females

1. Cauda dark brown or black. On *Vicia* spp. or *Lathyrus* spp. 2
– Cauda pale yellow, at most fuscous. Not on *Vicia* spp. 4
2. Ultimate rostral segment (URS) as long as (0.93–1.17×) 2HT. Ant.I, mandibular laminae (ML), abdominal tergite III, and genital plate with 13–19, 6–8, 20–24, and 23–31 hairs respectively. Ant.III with 62–89 secondary rhinaria. Body entirely dark brown or black in life. Tibia pale yellow except extreme base and apical ⅕ in macerated specimens . . . . . *M. nigra* Lee, n. sp.
– URS distinctly shorter (0.66–0.86×) than 2HT. Ant.I, ML, abdominal tergite III, and genital plate with fewer hairs, 9–15, 3–5, 15–22, and 16–24, respectively. Ant.III with relatively fewer secondary rhinaria (23–60). Body green except head and thorax including antenna, legs, siphunculi, and cauda black in life. Tibia black or dark brown in macerated specimens 3
3. Antenna with 46–64 secondary rhinaria on Ant.III. Ant.IV with 17–31 secondary rhinaria scattered throughout the segment. SIPH as long as or frequently longer (1.00–1.11×) than cauda . . . . . *M. crassicauda* Mordvilko

– Antenna usually with less than 40 (23–38) secondary rhinaria on Ant.III. Ant.IV without or rarely 1–7 secondary rhinaria on basal ½ in a line. SIPH usually shorter (0.76–1.00×) than cauda ..... *M. viciae* Buckton

4. SIPH pale, shorter (0.88–0.90×) than cauda. Ant.III with more than 30 (37–38) secondary rhinaria scattered throughout the segment. Ant.IV with 6–8 secondary rhinaria in a line. Processus terminalis (PT) 3.88–4.16× Ant.VIb ..... *M. litoralis* Müller

– SIPH dark brown or black, distinctly longer (1.30–1.81×) than cauda. Ant.III with less than 15 secondary rhinaria in a line. Ant.IV without or rarely 1–2 secondary rhinaria. PT more than 5.0× Ant.VIb 5

5. SIPH 0.93–1.05× as long as Ant.III. Ant.III and Ant.IV with 10–15 and 1–2 secondary rhinaria respectively. URS as long as (0.93–1.09×) 2HT and 0.63–0.78× Ant.VIb. Antenna slightly longer (1.07–1.21×) than body length ..... *M. lespedezae* (Essig and Kuwana)

– SIPH distinctly shorter (0.64–0.66×) than Ant.III. Ant.III with 6–9 secondary rhinaria and Ant.IV without secondary rhinaria. URS distinctly shorter (0.67–0.84×) than 2HT and 0.45–0.50× as long as Ant.VIb. Antenna distinctly longer (1.50–1.70×) than body length ..... *M. dooarsis* (Ghosh and Raychaudhuri)

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